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When is coffee not coffee? Luigi Ferdinando Marsigli's depictions of the coffee plant in "Notizie, di Costantinopoli; sopra la pianta del caffè" (1703)

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Abstract

The late 17th and early 18th centuries were an era in which the coffee drink was first becoming known throughout Europe, and there was a strong interest in disseminating what the plant looked like through the use of botanical illustrations. In 1685, Luigi Ferdinando Marsili published a coffee-related treatise entitled "Bevanda asiatica". This was followed in 1703 with the publication of the monograph "Notizie, di Costantinopoli; sopra la pianta del caffè". "Bevanda asiatica" conveys interesting information on a coffee-related manuscript acquired by Marsigli in Constantinople (present day Istanbul), as well as knowledge he gained as a slave of the Ottoman empire, when he was tasked with making coffee. "Notizie, di Costantinopoli "includes various engravings supposedly depicting coffee plants. We present the original watercolors used to create the engravings in "Notizie, di Costantinopoli"and present evidence for the first time since publication, 322 years ago, demonstrating that none of the engravings depict coffee plants.

Keywords

Arabica, botanical illustrations, café, *Coffea*, kaffee, Marsili, Yemen

Introduction

Becoming familiar with the history of coffee (*Coffea arabica* L.) in the Western world, reveals four main areas of interest starting in the late 1500s through the early-1700s. The first is the knowledge that a drink under various names in different lands and based on seeds from a plant in "Arabia Felix" (present day Yemen) was being consumed

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in Egypt, Syria and Turkey, from where it entered Europe. The second area of interest is the positive and negative effects of coffee consumption on human health, as physicians at the time had to be experts on plants that could be used to cure ailments. The third area of interest is the cultivation of the plant in areas outside its area of origin, such as the British, Spanish, French and Dutch colonies. Finally, the fourth area involves the elucidation of what the plant looked like based on its botanical characters, which was frequently communicated through botanical descriptions and illustrations.

The first botanical illustration depicting a coffee plant was published by Alpino in "De plantis Aegypti liber" (Alpino 1592). Alpino's woodcut illustration depicts a branch of a coffee plant, the leaves of which are opposite (borne at the same node and diametrically opposed), margins entire (i.e., smooth, not toothed, lobed, etc.) with five to six secondary veins, which represent important botanical characters that play a major role in our story. Alpino's botanical engraving was plagiarized in many subsequent books (see below) while other attempts at depicting the coffee plant were mostly inaccurate until 1715 (and many were still inaccurate afterwards), when elegant coffee botanical engravings were published by de la Roque (1715), followed a year later by de Jussieu (1716). The early 1700's was also a significant period for the botany of coffee due to de Jussieu's botanical description (de Jussieu 1716), the creation of the genus *Coffea* by Linnaeus (1735), and Linnaeus's (1737) comprehensive botanical description.

In this paper we explore two coffee-related publications by the Bolognese Luigi Ferdinando Count of Marsigli, or Marsili (1658–1730): "Bevanda asiatica" (Marsigli 1685) and "Notizie, di Costantinopoli; sopra la pianta del caffè" (Marsigli 1703; henceforth referred to as "Notizie, di Costantinopoli"). Marsigli was a man of the Enlightenment, and he was interested in a variety of subjects, including books, manuscripts, geology, mineralogy, cartography, oceanography, military affairs, botany, and mycology, among other topics. Our main focus will be the six botanical engravings supposedly depicting coffee plants in "Notizie, di Costantinopoli", but we begin our discussion with Marsigli's first coffee-related treatise.

"Bevanda asiatica" (1685)

In 1685, Marsigli published a 47-page treatise entitled "Bevanda asiatica" (Marsigli 1685), thus referring to coffee as an Asian drink. Even though an Asian origin for coffee might sound odd, considering that *C. arabica* (also referred to as Arabica coffee) is endemic to Africa and not to Asia, coffee at the time was sourced from Yemen, a country located in the southwestern region of the Asian continent.

"Bevanda asiatica", written in Italian, is divided in three sections. The first is entitled "Eminentissimo Signore" and is written in honor of Cardinal Francesco Buonvisi, whose name appears on the title page. The section includes a short treatise on the use of drinks among people in different countries, including the use of "cavé" [i.e., coffee] by the Turkish people. Marsigli also informs the Cardinal that he is including a translation of a Turkish manuscript that discusses "the origin, growth, maturation, and preparation of the fruit, to reduce it to a state, which is capable of being able to

form such a drink; and so that it may not be strange to see that the production of the said plant is narrated in a manner so contrary to what has been written up to now" (Marsigli 1685).

The second section is the parallel Italian–Ottoman Turkish translation of a manuscript written by a Turkish man to whom Marsigli refers to as "Cuseim Efendi", "Cosain Efendi" and "Cossain Effendi". The correct name for the manuscript's author is Hezârfen Hüseyin Efendi (the word "efendi" was used as an expression of respect), from whom Marsigli acquired the manuscript in Constantinople (present day Istanbul) in 1679 (Schnyder-v. Waldkirch 1988). The manuscript was part of Hüseyin's medicinal encyclopedia, entitled" Tuhfetü'l-Erîbi'n- Nâfia li'r-Rûhânî ve't-Tabîb" ("Useful and Skillful Gift for Doctors and All Creatures"; Yildirim 2020), of which nine copies are known (Tokat and Uygur 2012).

It is not clear whether Marsigli translated the manuscript, as this is not explicitly stated in "Bevanda asiatica". Yildirim (2020) assumes it was translated by Marsigli, while D'Amora (2020) assumes there was a translator. The latter option is more likely, as Marsigli himself, discussing the two Bosnians that purchased him from his initial enslavers (see below), states they were "pleased with the few Turkish words that I had learned" (translated from the Italian; Lovarini 1931). Furthermore, referring to Marsigli's first visit to Istanbul, Stoye (1994) states that Marsigli was "Accompanied by his Jewish interpreter or the dragomans of the Venetian embassy, willing if not apt to learn Turkish himself …".

The third paragraph in Hezârfen Hüseyin's manuscript discusses an Arabic text by Dā'ūd ibn 'Umar al-Aṇṭākī. The Italian text refers to Aṇṭākī's as "Schaich Daud Miscerli" and as "Sciaich Daud": "There was one called Schaich Daud Miscerli, from Cairo, who wrote that at the beginning of March it begins to grow, and that in August it is harvested, and that the tree is not taller than three palms, and as thick as a finger, and that its flower is white, and the fruit is known to everyone, and when cut open it is known to have a pit inside, which is also called the stone, and it is made of two pieces; and the wonder is, that one of those pieces, or grains, is black, and the other tends towards yellow, and the yellow one is better. Its nature in the first degree is hot, and in the second degree dry; (although some others have said that it is cold and dry, but they have strayed from the truth); its skin is hot, and the coffee plant itself is temperate, or could be said to be cold, and in fact it can be cold, while it is a little sour, a part indicating coldness. And up to here is the opinion of Sciaich Daud." The description incorrectly states that "the tree is no taller than three palms". A "palm" refers to the botanical term "palma" or "palmus", which is based on the width of the palm of the hand, i.e., ca. 8 cm (Stearn 2000).

Once Aṇṭākī's text is summarized, we learn that "However, I, Cosain, nicknamed Hefarsen (that is, of a thousand virtues or sciences), say that I have been continuously for more than two and a half years in Hiemena, or Arabia Felix and have traveled all its surroundings, lands, mountains, castles, and have found that in only two counties or districts does the tree that produces coffee grow. One is called the county of Usab, which includes the mountains that are around Zubeit up to opposite the place called Beitulfachiè, and the other county is called Naharii, near the strait opposite Gezan

Bender". Thus begins one of the earliest descriptions by someone that had observed coffee plants in Yemen *in situ*, where he found the coffee tree growing in two different areas. The trees, some of which are 20 to 30 years old, have white flowers, are very similar to cherry trees ("ciraso"; botanically various species of the genus *Prunus* L.) and are planted in a straight line. When the fruit reaches maturity, "it becomes dark red like the color of a wild cherry, and sweet like it; and if such fruits are collected with the stems, and mixed with our cherries from Castelli, except in eating them, and for the smell, and for the two grains, which have inside, they would not be distinguished from the cherry, indeed it can be said, that they are sweeter than the cherry". Hüseyin briefly discusses the drying of coffee on flat terraces, followed by dehulling. This is followed by one way to prepare a coffee drink: "In those countries they boil the dried peel, like that of a grape, while they boil it in water, which they drink in summer to moisten and refresh, and because of this sweetness all those who drink it believe it to be sugar, and in our countries they do not send it, because they do not pay for it as they do for grains: and this is all I can say about the shape, and quality, and plant of the Cavé, which I have seen, of the use, and of the flavor of its fruit, which I ate".

Hezârfen Hüseyin continues with the properties of the coffee drink and states that "by drinking it in the morning it preserves the stomach very much, indeed that it is useful in the highest degree to those who are taken by drunkenness, and especially to opium drinkers" and that "it has the virtue of removing sleep, it is not surprising, that it is of a nature equal to some hot medicines, which have the virtue of cheering, moving the spirits, taking away sleep from man". The manuscript translation ends by stating that the drink "will be more pleasing to the taste when mixed with saffron, musk, raw amber, aloe wood, or clove, which will be very suitable in the winter, as well as sugar. If cooked a lot, it will be beneficial to those who suffer from blood boils, and it is an undoubted thing, that if one drinks it ten or twelve times a day, the Cavé will become dull and melancholic, and on the contrary, drinking it moderately, he will not know melancholy, and will enjoy happiness".

The third section of "Bevanda asiatica" deals with Marsigli's experience in "l'arte di cucinar questo frutto" (i.e., "the art of cooking this fruit", i.e, the preparation of the coffee drink). This art was gained by Marsigli in a most unusual way. In 1683, when he was serving in the army of the Habsburg Holy Roman Empire, he was wounded and became a prisoner of the Ottoman Empire prior to the two-month long Siege of Vienna (July 17–September 12, 1683). He was held as a slave from July 2, 1683 to March 25, 1684, when ransom was paid for his freedom (Lovarini 1931). In his reminiscence of his days as a slave he stated, "My wounds were already beginning to heal, and for this reason they assigned me to various jobs, now in the stable and now cleaning the tents. I was finally given as a servant to a cupboard-keeper who ran a public coffee shop, where I had to burn it, cook it and distribute it to the buyers" (translated from the Italian; Lovarini 1931). By "burning" ("abbruciarlo") he means roasting, and most likely, to a very dark roast. In "Bevanda asiatica" he is more specific: "… and what I have learned in the chains of slavery, which condemned me for many days, as I have said, to practice the art of cooking this fruit, which in order to be reduced to the proper state to form

the promised drink, it is necessary to disclose many particulars, which in expounding them to you I know come also to appease the requests of those who have made so many inquiries, in order to learn every observation made by the Turks for such preparation …". He follows this with specific instructions on selecting coffee seeds of "a yellowish colour", roasting with constant motion in a copper pan to a "state of perfection, manifesting it by the colour which must be similar to that of dark umber, and when it has gone beyond black it will make a sign that the grains have become like coals, changing the strength, flavor and properties of the drink; and likewise one should not trust in seeing the simple surface, while at the cost of many lashes I have learned that it is easy to be deceived, that the roasting does not cover the surface of the grain, and in the middle it remains as if raw, and this causes damage to the flavor when reducing it to powder, and to be sure of this one should eat two or three of those grains…". This is then followed by pulverizing the roasted coffee beans with a metal pestle, storing it in a leather bag, and preparing the drink.

The only engraving in "Bevanda asiatica" is an attempt to illustrate a coffee plant on the title page. It includes a landscape with hills and trees and the terminal part of a branch with two alternate leaves that have serrated margins. Coffee (*Coffea*) leaves are not serrated but rather entire, i.e. smooth, and without teeth, lobes, etc.; cherry (*Prunus* sp. pl.) leaves are serrate or serrate-crenate. There are three round fruits attached to the branch, all of them resembling the fruits of cherry and not coffee. The engraving also depicts three seeds that are perfectly recognizable as coffee seeds. This makes sense as coffee seeds (beans) are the marketable product of the coffee drink, and were widely available at the time. The engraver's signature on the lower right corner appears to be "Ac. G. f", with the "f" being an abbreviation for the Latin word "fecit", i.e, "made it" (the engraving).

"Notizie, di Costantinopoli" (1703)

In 1703, Marsigli published a 14-page coffee monograph entitled "Notizie, di Costantinopoli; sopra la pianta del caffè da Luigi Ferdin. Conte Marsigli" ("Notes, from Constantinople; About the Coffee Plant by Luigi Ferdinando Count of Marsigli." The bottom half of the title page provides the Latin title, beginning with the Latinized name for the author: "Aloysi Ferdin. Com. Marsigli notitiae à Constantinopoli; circa plantam, quae calidi potûs coava, materiam ministrat" ("Luigi Ferdinando Count of Marsigli notes from Constantinople; concerning the plant which provides the material for the hot drink coffee"). The bilingual title reflects the fact that both languages are interspersed throughout the monograph.

The lower part of the title page is adorned with an engraving that is very similar to the one in "Bevanda asiatica". It includes a background of trees and hills, and superimposed on these, six alternate leaves, with serrate margins, four fruits with some resemblance to the shape of a coffee fruit, and three perfectly recognizable coffee seeds. The engraver initials are also "Ac. G. f". The place of publication or name of the publisher are not stated in the monograph.

Schoder's "Praefatiuncula"

The "Praefatiuncula" ("Preface") in "Notizie, di Costantinopoli" was written in Latin by Johann Samuel Schoder, who worked as an assistant for Georg Christoph Eimmart, an engraver and astronomer in Nuremberg (Gaab 2005). Marsigli started communicating with Eimmart in 1695 (Stoye 1994), who organized the preparation of the engravings for Marsigli's six volumes "Danubius Pannonico-Mysicus" (Marsigli 1726; Stoye 1994). Even though we have not located documentary evidence, it is possible that Eimmart recommended Schoder to Marsigli, thus resulting in the publication of "Notizie, di Costantinopoli".

In the Preface, Schoder makes it clear that he is simply relaying information provided by Marsigli: "Here then, beloved reader, are the diagrams which, from the forest of Marsilius' natural observations, while he is abroad serving his Caesar, the most illustrious and excellent author has so far been permitted to excerpt by his favor, and thus to beguile our leisure" (translated from the Latin). What did Schoder mean by "serving his Caesar"?

In 1683 Marsigli commenced his service in the army of the Holy Roman Emperor, Leopold I and participated in various military campaigns, including the 1683 Ottoman siege of Vienna and the Great Turkish War (1683–1699) between the Holy League (Austria, Russia, Venice and Poland) and the Ottoman Empire. The war ended in 1699 with the Treaty of Carlowitz. Once the treaty was ratified, Marsigli became the leader of the Austrian border commission in charge of the demarcation of the 850 km Habsburg-Ottoman borders, together with his Turkish counterpart. He completed this task in 1701 and returned to Vienna (Stoye 1994). The following year, he was sent to Germany during the War of the Spanish Succession (Stoye 1994) and in 1703 Marsigli and General Phillippe Arco surrendered the fortress of Breisach in southwestern Germany, near the border with France. This event resulted in Marsigli being dishonorably discharged from military service in early 1704 (Stoye 1994). Thereafter, Marsigli traveled extensively and pursued his scientific interests. Thus, as stated by Schoder, Marsigli was indeed "serving his Caesar" in 1703 and didn't have time to work on the monograph.

A similar situation occurred with Marsigli's "Dissertazione epistolare del fosforo minerale" (Marsigli 1698). At the time, Marsigli was involved in the demarcation of Habsburg-Ottoman borders, as mentioned above, and could not participate in overseeing the printing of the treatise. Based on an exchange of letters between the Leipzig lawyer Friedrich Benedict Carpzov (1649–1699) and Marsigli, it becomes apparent that Marsigli had asked Carpzov to oversee the printing of the treatise (Bortolotti 2017). This delegation of authority was likely responsible for "Bosforo" mistakenly being used instead of "fosforo" (phosphorus) in six instances (Bortolotti 2017). The error is acknowledged in a "Note to the Reader", in which Marsigli's absence is stated: "Not finding the Author present in that place, where this Dissertation was printed, some errors were interwoven …" (translated from the Italian; Marsigli 1698). A total of 250 copies were printed, 50 of which were sent to Marsigli, with nine copies going to selected people (Bortolotti 2017). The distribution of the remaining copies is unknown.

Coffee plant engravings and watercolors

Schoder's "Preface" is followed by four pages of coffee plants descriptions and five pages of engravings depicting six supposed coffee plants (Figs 1–5; one page includes two figures). Note that we have stated "supposed", as there are good reasons to conclude that the plants depicted are not coffee (discussed below).

The descriptions for each engraving vary and might include a description of leaves, flowers, fruit (where appropriate), and other details. The source for the information included in the descriptions is assumed to be Marsigli and was likely based on studying the watercolors. Marsigli had an interest in botany and he owned many botanical books (Bortolotti 2011). He also corresponded with several renowned botanists. His interest in botany is also evidenced in Volume VI of Marsigli's "Danubius Pannonico-Mysicus", which includes "some 700 plants named (but not illustrated)" (Stoye 2004). In the introduction to the plants section in "Danubius Pannonico-Mysicus" (Marsigli 1726) Marsigli states that he identified the plants based on Caspar Bauhin's "Pinax theatri botanici" (Bauhin 1623) and on Jakob Theodor's "New vollkommen Kräuter-Buch" (Theodorus 1664), which includes ca. 3000 woodcut illustrations.

If Marsigli acquired the watercolors in 1679 together with Hezârfen Hüseyin's manuscript, why did he not mention or include the engravings in "Bevanda asiatica", published in 1685? Could they have been acquired during his second visit to Istanbul in 1691–1692? Even though Stoye (1994) states that "It remains difficult to distinguish with precision between the materials assembled by Marsigli in his two visits to Istanbul, in 1679–1680 and 1691–1692", Hünersdorff and Hasenkamp (2002) states the monograph was "illustrated with plates based on Turkish drawings of coffee plants which he had brought from Istanbul to Italy in 1691." Some of the watercolors have handwritten notes in Italian and all of them have handwritten Ottoman Turkish text (discussed below). The depiction of "coffee" plants implies that the watercolors were created in Yemen, which was under Ottoman rule from 1538 to 1636 (Hathaway 2006).

The watercolors acquired by Marsigli in Istanbul are depicted in Figs 1–5. They are housed at the Biblioteca Universitaria di Bologna (BUB; Università di Bologna, Italy) and are here presented in the same order as their engravings appear in the monograph. Three watercolors (Figs 1, 2, 5) represent what are supposed to be four coffee plant branches (one watercolor depicts two different branches) and two (Figs 3, 4) represent what are supposed to be entire coffee plants. The reason why we state "supposed" is because five of the depicted plants have alternate leaves, with indistinctly lobed or weakly undulate margins, when, as stated above, coffee has opposite, entire leaves (de Jussieu 1716; Linnaeus 1737). The remaining plant (Fig. 3), supposedly depicting an entire coffee tree, exhibits both opposite and alternate leaves, with serrate margins; therefore, it does not represent a coffee plant. As de Jussieu stated, coffee leaves should be "without serrations or crenellations in their contours" (translated from the French; de Jussieu 1716).

Figure 1. A (left) **B** (right). These figures are among five watercolors acquired by Marsigli in Istanbul, supposedly depicting coffee plants. Marsigli identified them as separate figures, despite being part of the same watercolor. **A** is identified as "Zellebe Caffessi" while **B** is identified as "Beitilfaki caf:" (present day Bayt al-Faqih). See text for Ottoman Turkish text transcription and translation. Neither branch represents a coffee plant. © Alma Mater Studiorum Università di Bologna – Biblioteca Universitaria di Bologna. All rights reserved. (BUB Ms. Marsili 1044, 087D, f. 34r).

The "coffee plants" in "Notizie, di Costantinopoli"

Fig. 1A, B, which are part of the same watercolor, supposedly represent a coffee branch with coffee fruits. The fact that the leaves are alternate and not opposite, with undulate (Fig. 1A) and weakly 3-lobed leaves (Fig. 1B), means that neither one represents coffee. The branch in Fig. 1A is identified in the monograph as "Zellebi Caffesi, Caffè

Figure 2. "Caffe Iemeni" (Yemeni coffee) branch with fruits. The color and position of the leaves (alternate) as well as the shape of the fruit are incorrect for coffee plants. See text for Ottoman Turkish text transcription and translation. © Alma Mater Studiorum Università di Bologna – Biblioteca Universitaria di Bologna. All rights reserved. (BUB Ms. Marsili 1044, 87D, f. 35r).

Nobilis ò, di Monti di Senaam", with "Monti di Senaam" referring to the mountains of Sanaa, the present-day capital of Yemen. The handwritten Ottoman Turkish text above the plant in Fig. 1A reads "ḳahve-i Salāba", i.e., "coffee of Salaba" (Salabat Banī ʿAwwām, a town in the northern Tihama), while the handwritten Italian text below the plant reads "Zellebe Caffessi". Thus, "Zellebi "and "Zellebe" refer to Salaba. It is not clear why the Italian text description for "Zellebi Caffesi" in the monograph refers to Sanaa while the Ottoman Turkish text refers to Salaba. Fig. 1A depicts shoots showing both sides of the leaves, with the abaxial (lower) side having a whitish color

Figure 3. A supposed coffee tree from the land of Yemen. The leaves are both alternate and opposite. They are also serrated, which is not a trait of coffee plants. The size and shape of the fruits are also incorrect for coffee. See text for Ottoman Turkish and Italian text transcription and translation. © Alma Mater Studiorum Università di Bologna – Biblioteca Universitaria di Bologna. All rights reserved. (BUB, Ms. Marsili 87D, f. 33r).

that perhaps was used to represent a lighter green color when compared to the adaxial (upper) side. Otherwise, a whitish color does not fit the description of coffee. According to de Jussieu (1716), the leaves are a "beautiful bright green and shiny above, pale green below" (translated from the French). This matches Linnaeus's (1737) description: "The upper surface is smooth, dark green, and shiny, while the lower surface is pale green, smooth, and dull" (translated from the Latin). These descriptions match *in vivo* observations of Arabica coffee. The positioning of the fruits is not representative of coffee, as they appear to be emerging directly from the stem, or petioles (leaf stalk) and not from the leaf axils. The infructescences (fruit bearing structure) also do not match coffee. Even though the color of the fruits is brown-reddish, they are described as dark yellow. The terminal end of some of the fruits have been "cut into smaller circles", i.e., they have been cut (transversely) to show the seeds.

Figure 4. A purported Yemeni coffee sapling, supposedly the third coffee species identified. The alternate leaves and their color are not appropriate for coffee. See text for Ottoman Turkish and Italian text transcription and translation. © Alma Mater Studiorum Università di Bologna – Biblioteca Universitaria di Bologna. All rights reserved. (BUB Ms. Marsili 1044, 087D, f. 38r).

The handwritten Ottoman Turkish text above the plant in Fig. 1B reads "ḳahve-i beyt el-faḳīḥ", while the handwritten Italian text below the plant reads "Beitilfaki Caf:", both of them meaning "Coffee of Bayt al-Faqih" (a town in Yemen). At the time, Bayt al-Faqih was an important coffee marketplace, but not a coffee-growing area. It is the same place cited by Douglas as "Betelfaguay": "The coffee that we bought up at Betelfaguay raised the price of it considerably; the very news of our arrival had begun it: and this happening to be likewise the time of carrying it off for Egypt and Turkey, made it still dearer that it would have been" (Douglas 1727). The leaves are described as dark green and very obtuse (i.e., having a rounded tip). Coffee plants do not have obtuse leaves. Linnaeus (1737) description of coffee leaves is, as expected, quite clear and specific: "Each leaf is ovate-lanceolate, tapering to an oblong point" (translated from the Latin). The leaves of Arabica coffee can also be elliptic to broadly elliptic, or

Figure 5. Leaves and flowers of "coffee" plants. The shape and position of the leaves (alternate), is not characteristic for coffee plants. See text for Ottoman Turkish and Italian text transcription and translation. © Alma Mater Studiorum Università di Bologna – Biblioteca Universitaria di Bologna. All rights reserved. (BUB Ms. Marsili 1044, 087D, f. 36r).

oblong-elliptic, and always with an acuminate (an abrupt tapering point) apex. Assuming the lighter colored leaves are depicting the adaxial side, this would be similar to that depicted on Fig. 1A. The fruits are described as rounder with a sulfur-green color. The terminal end in some fruits has also been cut in half (transversely). The description in the monograph concludes by stating that the seeds sometimes come mixed with other types of seeds. Taking into consideration that the branch cannot be a coffee branch, the mixing of seeds would imply that seeds from whatever this plant represents, were sometimes mixed with other seeds, some of which were real coffee seeds.

The handwritten Ottoman Turkish text above the branch in Fig. 2 reads "ḳahve-i Yemen(ī)" while the handwritten Italian text below the plant reads "Caffe Iemeni", both of them meaning "coffee of Yemen"). The Latin description in the monograph

describes it as a "promiscuous" plant "bearing grains of the warm drink, or coffee, commonly used by the Turks in place of wine". As in the previous two figures, it includes the lighter color on the adaxial side. The leaves are described in the monograph as "more obtuse, with a deep and pleasant green color". The fruits are "more oblong, slender, and reddish purple". The illustration rules out coffee.

The handwritten Ottoman Turkish text on the bottom left side of Fig. 3 reads "vilāyet-i Yemen" ("land of Yemen"), while the one on the bottom right side reads "şecer[-]i ḳahve" ("coffee tree"). The handwritten Italian text below the Ottoman Turkish text reads "Beitilfaki questo arbore è, e nella figura si mostra "(left side) and "il frutto già pronto ò maturo per essere racolto" (right side), translated as "Beitilfaki this tree is, and in the figure the fruit is already ready or ripe to be harvested." "Beitulfaki Caffè" is described in Italian in the monograph as a tall plant ("pianta altera"). The description, although poor, may be representing an Arabica coffee plant, which can attain 7 m in height. At this point, it is relevant to remember that in "Philosophia botanica", Linnaeus was quite clear about the function of botanical illustrators: "All parts should be recorded in their "natural" position and "size", including the most minutes parts of the "fruit-body"" (Linnaeus 2005). Linnaeus's philosophy must be contrasted with the watercolor (Fig. 3) and the plant description in the monograph, here translated into English: "The true likeness of the coffee plant. Or rather; a genuine image of that shrub-like tree, from which those beans are gathered, which, in place of red wine, (coffee) provide the material for the hot drink, (Coava) customarily drunk by the Turks." The watercolor depicts a plant rendered with ample artistic license, as it shows a plant taller than the surrounding mountains, with the size of the fruit being almost as large as the leaves, and an enormous trunk. Remarkably, the plant in Fig. 3 also exhibits both alternate and opposite, weakly 3-lobed leaves. Another part of the description in the monograph translates as: "The tree is very large, like a linden; it has small flowers with five petals: the fruits are smaller; similar only to themselves, almond-shaped, purple. The leaf is like that of a cherry, incised and serrated. Dr. Samuel Dale, Physician and Pharmacist, residing in Braintree in Essex; in his Introduction to "Materia medica"." In fact, Dale's book (1693) does not mention serrated leaves. Therefore, the word "serrated" might have been included by Marsigli simply because it fits the shape of the leaves in the watercolor. Kusukawa's (2006) comment on the uses of pictures is most appropriate for understanding the plant shown in Fig. 3: "Naturalistic depiction does not necessarily guarantee direct observation by the draughtsman of the object depicted, nor does it prove the actual existence of the object." It is clear that the watercolor was not based on an actual coffee plant.

The Ottoman Turkish text on the left side of Fig. 4 reads "ṭoplı olur iki arşun miḳdārı" ("all in all measures two *arşın*"; an "arşın" is a Turkish ell/yard, ca. 0.75 m), while the text on the right side reads "Yemenī ḳahve fīdānı henüz tāze" ("Yemeni coffee sapling, yet fresh/young"). The handwritten Italian text at the bottom of Fig. 4 is harder to elucidate: "Beitilfaki caffè pianta, che in cassun passa, nella casa di Ramasan capita: e crebbe due Arsini, e fece il frutto" followed by "come 1.1.1" (on the right side). It was not possible to determine the meaning of "cassun passo", "capita" (written as "Capitan" in the monograph), or of "come 1.1.1". As for "Ramasan", it might be a

reference to the Islamic holy month of Ramadan and thus, to coffee growing in Yemen ("the house of Ramadan"). Thus, it would translate as "Beitilfaki coffee plant, which is present in any place in the house of Ramasan: and grew two Arsini, and made the fruit" (two arsini would be equivalent to 1.5 m or 4.9 feet).

The monograph description for Fig. 4 identifies the plant as "Beitulfaki Caffè "and as the third species. There is a handwritten "3°" and "2°" at the bottom of Fig. 1A, B, respectively, perhaps indicating that these are two of the three species being referred to. At the time, there was only one commercially traded coffee species in Yemen, i.e., Arabica (*C. arabica*); therefore, it is impossible for a traveler in Yemen to have observed more than one *Coffea* species. The flowers are described as having a "sulfur-yellow and rose pink" color. They are also described as tri-petalous. Arabica coffee flowers are white, very rarely tinged pink, and although there is some variation, they usually have five corolla lobes ("petals"). The fruit is described as having a spherical shape and a whitish appearance, while Linnaeus described them as ovate and red (Linnaeus 1737); Arabica coffee fruits do not color whitish, at any phenological stage. The leaves are described as dark on abaxial side and silvery on the adaxial side, which could be no further from the truth for coffee, whose leaves, as mentioned above, were described by Linnaeus (1737) as follows: "the upper surface is smooth, dark green and shiny, while the lower surface is pale green, smooth, and dull" (translated from the Latin). As mentioned before, the leaves are also alternate and not opposite. The tree in the watercolor, whose root system is depicted, also has no resemblance to coffee whatsoever, as it lacks the characteristic central taproot, the deep axial roots and multiple lateral roots, and the feeder and hair roots (Nutman 1933; Wintgens 2012).

The Ottoman Turkish text on the lower right side in Fig. 5 reads "yapraḳları bü[yü] klügi bu ḳadardur" ("the size of its leaves is like this") "çiçegi daḫı böyledür "("its blossoms are also like this"). Thus, the text implies that the watercolor shows the original size. The handwritten Italian text at the bottom of Fig. 5 reads "Queste sono le foglie, e fiori che fece l'arbore. Le foglie nel interno sono oscure e per di fuori argentee", which translates as "These are the leaves, and flowers that the tree/plant made. The leaves are dark on the inside and silvery on the outside." Referring to the leaves, a Latin description in the monograph states, "Obversâ parte, nigricant; adversâ, splendent", which translates as "on the facing side they are blackish; on the opposite side, they shine". None of the descriptive elements mentioned above, or those depicted in Fig. 5, matches coffee, in any way.

Notes on the coffee plant

As in the title page, the next-to-last page in the monograph includes a bilingual heading: "Note, sopra la pianta del caffè" (Italian; translated as "Notes on the coffee plant") followed by "Annotationes, in plantam, de cujus fructu paratur caffè" (Latin; translated as "Annotations on the plant, from whose fruit coffee is prepared."). This is followed by

two pages of excerpts on coffee-related writings. The first excerpt, taken from Ray's "Historiae plantarum" (1688) is followed by an excerpt from Togni's "Raccolta delle singolari qualità del caffè" (1675). A third excerpt is attributed to "Cusaim Effendi" (i.e., Hezârfen Hüseyin Effendi) but it does not originate in Hezârfen Hüseyin's manuscript in Marsigli (1685). The fourth excerpt also originates in Ray's "Historiae plantarum" (1688).

Subsequent use of the engravings: Michael Bernhard Valentini and Jacob Spon

What is quite unusual about the depiction of the coffee leaves in the watercolors is that the arrangement and shape of the coffee leaves illustrated by Alpino over 100 years earlier was correct (Alpino 1592). Furthermore, Alpino's woodcut illustration had been plagiarized by Parkinson (1640), Vesling (1640), Bauhin and Cherler (1650), Peters (1666), Chabrée (1666, 1677, 1678), and de Blegny (1687), among others; therefore, the correct depiction of the leaves was not rare.

In 1704, Valentini published the first edition of "Museum Museorum", which includes a discussion on coffee and its misuse, accompanied by an unsigned engraving copied from Fig. 4 in "Notizie, di Costantinopoli "(Valentini 1704). A second edition was published in 1714, followed by the first and second Latin edition published in 1716 and 1732, respectively (Valentini 1714, 1716, 1732). All these editions contained the same text and the same figure as the 1704 edition (i.e., Fig. 4 from "Notizie, di Costantinopoli").

In 1705, Spon published "Bevanda asiatica: hoc est; Pysiologia potus café" ("Asian Beverage: that is; the physiology of the coffee drink"; Spon 1705). Spon's book is the second edition of his Latin translation of Dufour's book, "Traitez nouveaux & curieux du café, du thé et du chocolate" (Dufour 1685). In the Preface, written by an unnamed author, a reason for including Marsigli's engravings is given: "For indeed, because after such a lucid and accurate physiology of the coffee drink [i.e., the translation of Dufour's book], all that science would be left vague and in a way incomplete, without the more refined plant information; Therefore, we did not stop working until we had more certainty about that very plant, from whose berries, roasted, and infused with boiling water, a healthy drink is prepared. Know, then, that very exact images of him [i.e., the coffee plant] came to us from Arabia, by way of Constantinople; the genuine expression of which may be allowed to be in the least doubted: which, as I thought the curious, will, without doubt, delight the forms; and thus, by completing this treaty, they will, I think, complete the matter" (translated from the Latin; Spon 1705). An article in the German newspaper "Nützliche Samlungen" stated that Spon's "Bevanda asiatica" included "The classes of the various Arabian coffee trees according to their names and shapes" (Anonymous 1758; translated from the German).

Spon's Preface is followed by an unpaginated section including Ray's coffee-related text (Ray 1688), which was included in the last page of "Notizie, di Costantinopoli" (see above). This is followed by Marsigli's plant descriptions (with minor editing) and all the coffee plant engravings from "Notizie, di Costantinopoli". A significant difference is that

the engraving for Fig. 6 is signed "s: Frid: Leopold excudit." The "s" is an abbreviation for the Latin word *sculpsit*, i.e., "engraved by" while *excudit* is the Latin word for "published by". Josef Friedrich Leopold was a German engraver, publisher, bookseller, and prints seller (Shapero Rare Books 2015). Based on a close examination, it is possible that Spon (1705) used the same copper plates as those used in "Notizie, di Costantinopoli".

The extreme rarity of "Notizie, di Costantinopoli"

It could be hypothesized that being familiar with Alpino's coffee branch engraving, as discussed above, might have influenced Marsigli's decision to publish his monograph, as it would be providing new and unusual botanical engravings of what he identified as three different types of coffee plants, most of which had alternate leaves, some indistinctly 3-lobed, and most with serrated leaf margins. Even though we do not know how many copies of "Notizie, di Costantinopoli" were printed, we know that 250 copies of "Dissertazione epistolare del fosforo" (Marsigli 1698) were printed (Bortolotti 2017). It would not be unreasonable to assume that a similar print run was made for "Notizie, di Costantinopoli", which begs the question: why is it so extraordinarily rare? We have only been able to locate two copies. The first one belonged to the renowned German botanist and physician Christoph Jacob Trew and is housed at the Universitätsbibliothek Erlangen-Nürnberg (Germany). A second copy was sold in 2023 by a book dealer in Germany. A third copy, now lost, was housed at "Bayerische Staatsbibliothek" (Munich, Germany). Could the rarity of "Notizie, di Costantinopoli" be a result of Marsigli realizing that the plants were not coffee, resulting in most of the copies being destroyed?

Conclusions

The extreme rarity of "Notizie, di Costantinopoli" could be used to explain why, to the best of our knowledge, there are no publications firmly stating that Marsigli's identifications are erroneous. Until the "Notizie, di Costantinopoli" copy at the Universitätsbibliothek Erlangen-Nürnberg was made available online in 2018, it would have been extremely difficult to consult Marsigli's monograph, although all the botanical engravings were published in Spon (1705). We are not aware either of any published criticism on Spon's engravings.

Referring to the coffee tree, Valentini stated in 1714 that "It is described in the most beautiful way by the honored Italian Count Luigi Ferdinand Marsigli in the so-called "Notitia di Constantinopoli Sopra la pianta del Caffè", in which book various species are depicted, the most prominent of which can be seen here in the large figure" (translated from the German; Valentini 1704; the same text is used in the second edition (1714) and in the first and second Latin editions 1716, 1732). As discussed above, there is no possibility for "various species" having been depicted.

In a 1715 letter on the historical confusion and debate surrounding the classification of coffee, Volkamer commented on Marsigli's botanical engravings: "... Count Marsigli, spared no expense in this matter. He had very exact images of the tree and fruit painted, brought from the Province of Yemen through Constantinople, engraved on six copper plates, and exposed them to public view. These figures, however, lacking a certain character, disappoint the wishes and expectations of the curious" (translated from the Latin; Volkamer 1715). His comment is clearly critical of the figures, as they lack the necessary characters to properly describe the plant, such as those used by Linnaeus (1737), i.e., root, stem, branch, leaves, petioles, and flower. Despite Volkamer's statement that Marsigli "had very exact images of the tree and fruit painted, brought from the Province of Yemen" it is clear that the plants are not coffee. Had they been actual coffee plants they would be readily recognizable as such. Volkamer's 1715 letter includes a beautiful engraving of a coffee branch (Volkamer 1715; located between pages 336–337 in the copy we examined) depicting opposite ovate-lanceolate leaves and perfectly identifiable coffee fruits. Volkamer's letter (Volkamer 1715) was also published in Valentini (1716), which is interesting because Volkamer's letter is critical of Marsigli, while Valentini's comments are quite complimentary (see above).

In 1715, de la Roque published "Voyage de l'Arabie heureuse" (de la Roque 1715), a book containing beautiful and more accurate botanical engravings of an entire coffee plant, as well as a coffee branch with fruits and leaves. A comment by de la Roque, referring to the engravings in his book (de la Roque 1715), makes one wonder if he had seen Marsigli's engravings: "The curious in observing this bough, the leaves and the fruits of which are drawn on the natural size, will easily perceive how very different this is from all those, which we have seen in many books, where the authors have pretended to represent the boughs of the coffee tree" (English translation from de la Roque 1732).

In recent times, the comments on Marsigli's engravings have been quite positive. According to Hünersdorff and Hasenkamp (2002), the figures in "Notizie, di Costantinopoli" "are among the earliest faithful representations of the coffee plant in a western book." Hünersdorff also states that these are "greatly improved pictures of the coffee plant drawn from nature in the Yemen by an unknown Turkish artist" (Hünersdorff n.d.). Schnyder-v. Waldkirch (1988) asserts that Marsigli's engravings "significantly clarified Europe's idea of the coffee plant" and "replaced the traditional conception of the coffee plant, which had remained unchanged since Alpinus, with new images" (Schnyder-v. Waldkirch 1988; translated from the German). Referring to the Marsigli's engravings included in Spon (1705), Hünersdorff and Hasenkamp (2002) commented that the book is "of special interest for the new plates used which show more faithful renderings of the coffee tree with Turkish subtitles, a marked improvement on the woodcut used for previous editions which was based on Alpinus" (Hünersdorff and Hasenkamp 2002). These comments were made by outstanding bibliographers who might not necessarily have been familiar with the botanical characters of the coffee plant.

Marsigli's two coffee-related books present a microcosm of the coffee world in the early 1700s: a popular drink from a distant country was still a novelty and its botanical identity and medical properties were areas of widespread interest among the cognoscenti. At the time

of publication, the "coffee" plant engravings in "Notizie, di Costantinopoli" must have been quite striking because they presented substantially more coffee plant morphology than any previously published book. If Marsigli tried to erase the evidence by not distributing "Notizie, di Costantinopoli", thus explaining its rarity (as suggested above), his attempt completely failed when Valentini kept publishing an engraving of Fig. 4 in the monograph until 1732 (Valentini 1704, 1714, 1716, 1732), and when Spon (1705) published "Bevanda asiatica", which includes all the botanical engravings in "Notizie, di Costantinopoli".

Linnaeus did not cite either one of Marsigli's coffee-related books in his description of *Coffea* in "Hortus Cliffortianus" (Linnaeus 1737). Almost 25 years later, Linnaeus cited Spon (1705) in the Linnaean dissertation "Potus coffeae" (Linnaeus 1761). One wonders what Linnaeus's response would have been after examining the botanical engravings purportedly representing plants in the genus he had erected.

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References

Alpino P (1592) De plantis Aegypti liber. Venice: Franciscum de Franciscis Senensem. https://bibdigital.rjb.csic.es/idurl/1/13459

Anonymous (1758) Nützliche Samlungen, 3 October 1757, 1251. https://www.digitale-sammlungen.de/en/view/bsb10530419_00635_u001?q=chaova&page=6,7

Aṇṭākī Dā'ūd ibn 'Umar al- (1659) The nature of the drink kauhi, or coffe, and the berry of which it is made described by an Arabian phisitian. Oxford: Henry Hall. https://quod.lib.umich.edu/cgi/t/text/text-idx?c=eebo;idno=A37215.0001.001

Bauhin C (1623) "Pinax theatri botanici". Basel: Ludovici Regis. https://bibdigital.rjb.csic.es/idurl/1/10754

Bauhin J, Cherler JH (1650) Historia plantarum universalis, nova et absolutissima, Tomus I. Yverdon: [s.n.]. https://bibdigital.rjb.csic.es/idurl/1/13085

Bortolotti I (2011) Luigi Ferdinando Marsili (1658–1730) e la biblioteca donata all'Istituto delle Scienze di Bologna. M.S. Thesis, Alma Mater Studiorum, Università di Bologna, Italy.

Bortolotti I (2017) Luigi Ferdinando Marsili (1658–1730) e l'editoria erudita nella Repubblica delle Lettere tra Sei e Settecento. PhD Thesis, Università degli Studi di Milano, Italy.

Chabrée D (1666) Stirpium icones et sciagraphia: cum scriptorum circa eas consensu et dissensu ac caeteris plaerisque omnibus quae de plantarum natura, natalibus, synonymis, usu & virtutibus, scitu necessaria. Geneva: Typis Phil. Gamoneti & Iac. de la Pierre. https://archive.org/details/bub_gb_wtYlHw69kg8C/page/n1/mode/2up

Chabrée D (1677) Stirpium icones et sciagraphia cum omnibus, quae de plantarum natura, natalibus, synonymis, usu & virtutibus scitu necessaria: quibus accessit scriptorium circa eas consensus, & dissensus. Geneva: Ioannem Anthonium Chouet. https://bibdigital.rjb.csic.es/idurl/1/13598

Chabrée D (1678) Omnium stirpium sciagraphia et icones, quibus plantarum et radicum tum in hortis cultarum, tum in urbium fossis & muris, pratis, arvis, montibus, collibus, nemoralibus, fluviis, riguis & littoralibus, villis & pagis, spontè provenientium, nomina, figura, natura, natales, synoyma, usus & virtutes, docentur. Cum doctissimorum scriptorum circa cas consensu & dissensu. Geneva: Samuelis de Tournes. https://bibdigital.rjb.csic.es/idurl/1/13599

D'Amora R (2020) Luigi Ferdinando Marsili, Hezârfenn and the coffee: texts, documents and translations. Oriente Moderno 100: 106–119. https://doi.org/10.1163/22138617-12340230

Dale S (1693) Pharmacologia, seu manuductio ad materiam medicam. London: Samuel Smith & Benjamin Walford. https://archive.org/details/b30328470_0002/page/n11/mode/2up

de Blegny N (1687) Le bon usage du thé du caffè et du chocolat pour la preservation & pour la guerison des maladies. Paris: Estienne Michallet. https://doi.org/10.5962/bhl.title.127716

de Jussieu A (1716) Histoire de café. Histoire de l'Académie Royale des Sciences, Année M. DCCXIII. Paris: L'Imprimerie Royale, 291–299. [NB: de Jussieu's paper states that he had presented a lecture on coffee at l'Académie in 1713. Subsequently, he considered it necessary to replace it with the present paper, read at l'Académie on 4 May 1715 (as stated in the text). The journal title page indicates it corresponds to 1713, but the bottom of the page indicates it was published in 1716.]

de la Roque J (1715) Voyage de l'Arabie Heureuse. Paris: Charles Huguier and André Cailleau.

de la Roque J (1732) A Voyage to Arabia Fœlix. London: E. Symon. https://archive.org/details/voyagetoarabiafe00laro

Douglas J (1727) A Supplement to the Description of the Coffee Tree, Lately Published by Dr. Douglas. London: Thomas Woodward. https://doi.org/10.5962/bhl.title.127479

Dufour PS (1685) Traitez nouveaux & curieux du café, du thé et du chocolate. Lyon: Iean Girin & B. Riviere. https://archive.org/details/bub_gb_XDU97KHMFu4C

Gaab H (2005) Zur Geschichte der Eimmart-Sternwarte. Regiomontanusbote Spezial, Vol. 18, Nuremberg.

Hathaway J (2006) The Ottomans and the Yemeni coffee trade. Oriente Moderno 86: 161–171. https://www.jstor.org/stable/25818052

Hünersdorff R von (n.d.) Catalogue 27. Printed books, manuscripts, maps, prints & drawings 1700–1799. Hünersdorff, [n.p.].

Hünersdorff R von, Hasenkamp HG (2002) Coffee: A Bibliography. A Guide to the Literature on Coffee. Hünersdorff, 687 pp.

Kusukawa S (2006) The uses of pictures in the formation of learned knowledge: the cases of Leonhard Fuchs and Andreas Vesalius. In: Kusukawa S, Maclean I (Eds) Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe. Oxford University Press, 274 pp.

Linnaeus C (1735) Systema naturae. Leiden: Joannis Wilhelmi de Groot. https://www.biodiversitylibrary.org/item/15373#page/1/mode/1up

Linnaeus C (1737) Hortus Cliffortianus. Amsterdam: [s.n.]. https://www.biodiversitylibrary.org/item/13838#page/4/mode/1up

Linnaeus C (1761) Potus coffeae. Uppsala: [s.n]. https://huntbot.org/linndiss/sites/default/files/Liden-118.pdf

Linnaeus C (2005) Linnaeus' *Philosophia botanica*, translated by S. Freer. Oxford University Press, 402 pp.

Lovarini E (1931) La schiavitù del Generale Marsigli sotto i tartari e i turchi da lui stesso narrata. Nicola Zanichelli, 192 pp. http://asa.archiviostudiadriatici.it/islandora/object/libria%3A150792#mode/2up

Marsigli LF Conte di (1685) "Bevanda asiatica", brindata all'eminentissimo Bonvisi, nunzio apostolico appresso la maestà dell'Imperatore, &c. da Luigi Ferdinando Co. Marsigli, che narra l'historia medica del cavé. Vienna: Gio. Van Ghelen. https://digital.onb.ac.at/OnbViewer/viewer.faces?doc=ABO_%2BZ168062107

Marsigli LF (1698) Dissertazione epistolare del fosforo minerale ò sia della pietra illuminabile bolognese. Leipzig: [s.n.] https://wellcomecollection.org/works/p9a9r83j

Marsigli LF (1703) Notizie, di Costantinopoli; sopra la pianta del caffè. Da Luigi Ferdin. Conte Marsigli. AloysI Ferdin. Com. Marsigli Notitiae à Constantinopoli; circa plantam, quae calidi potûs coava, materiam misistrat [s.n., s.l.]. https://nbn-resolving.org/urn:nbn:de:bvb:29-bv008962253-1

Marsigli LF (1726) Danubius Pannonico-Mysicus, observationibus geographicis, astronomicis, hydrographicis, historicis, physicis perlustratus. Vol. VI. The Hague: P. Gosse, R. C. Alberts and P. de Hondt; Amsterdam: H. Uytwerf and F. Changuion.

Nutman FJ (1933) The root-system of *Coffea arabica*. Pt. I. Root-systems in typical soils of British East Africa. The Empire Journal of Experimental Agriculture 1: 271–296.

Parkinson J (1640) Theatrum botanicum. London: Tho. Cotes. https://www.biodiversitylibrary.org/bibliography/152383

Peters F (1666) F. P. de Potu Coffi. Frankfurt: Aegidium Vogelium. https://books.google.com/books/about/F_P_de_potu_coffi.html?id=M3COYJdzZmkC

Ray J (1688) "Historiae plantarum", Tomus secundus. London: printed by M. Clark and published by Henry Faithorne.

Schnyder-v. Waldkirch A (1988) Wie Europa den Kaffee Entdeckte. Zurich: Jacobs Suchard Museum, 255 pp.

Shapero Rare Books (2015) 50 Fine Books, Autumn 2015. London: Shapero Rare Books.

Spon J (1705) "Bevanda asiatica": hoc est; physiologia potus café. [Leipzig]: [s.n.]. https://www.digitale-sammlungen.de/en/details/bsb10229148

Stearn WT (2000) Botanical Latin. History, Grammar, Syntax, Terminology and Vocabulary, Fourth Edition. Timber Press, 546 pp.

Stoye J (1994) Marsigli's Europe 1680–1730. The Life and Times of Luigi Ferdinando Marsigli, Soldier and Virtuoso. Yale University Press, 356 pp.

Theodorus J (1664) New vollkommen Kräuter-buch. Basel: König/Werenfels. https://www.biodiversitylibrary.org/bibliography/7091

Togni M (1675) Raccolta delle singolari qualità del caffè. Venice: Francesco Valuasense.

Tokat F, Vedat Uygur C (2012) Hezârfen Hüseyin Effendi'nin "Tuhfetü'l- Erîbi'n- Nâfia li'r-Rûhânî ve't-Tabîb"i. Turkish Studies – International Periodical For the Languages, Literature and History of Turkish or Turkic 7: 2446–2454. https://doi.org/10.7827/TurkishStudies.3603

Valentini MB (1704) Museum museorum, oder Vollständige Schau-Bühne aller Materialien und Specereyen. Frankfurt am Main: Johann David Zunners. https://www.biodiversitylibrary.org/page/51494058

Valentini MB (1714) Museum museorum, oder Vollständige Schau-Bühne aller Materialien und Specereÿen. Frankfurt am Main: Johann David Zunners and Johann Adam Jungen. https://www.biodiversitylibrary.org/page/56248718

Valentini MB (1716) Michaelis Bernhardi Valentini, Archiatri Hassiaci & Prof. Medici Gisseni, Historia Simplicium Reformata, sub Musei Museorum. Frankfurt am Main: Johannem Adamum Jungium. https://www.digitale-sammlungen.de/en/view/bsb10213854?page=9

Valentini MB (1732) Michaelis Bernhardi Valentini, Archiatri Hassiaci & Prof. Medici Gisseni, Historia Simplicium Reformata, sub Musei Museorum. Offenbach am Main: Johannem Ludovicum König.

Vesling J (1640) Prospero Alpini de plantis Aegypti liber. Cum observationinbus & notis Ioannis Veslingii. Padua: Typis Pauli Frambotti Bibliopolae. https://bibdigital.rjb.csic.es/idurl/1/13464

Volkamer JC (1715) Observatio CLXVIII. Dn. Joh. Christoph. Volkameri. De gelsemino arabico, fructum café ferente Arbore. Academiae Caesaro-Leopoldinae Naturae Curiosorum Ephemerides, sive, Observationum medico-physicarum … Nürnberg: Wolfgang Michahelles & Johann Ernst Adelbulnerus, 378–379. [Also printed in Valentini 1716, 575–576] https://www.biodiversitylibrary.org/bibliography/50584

Wintgens JN (2012) The coffee plant. In: Wintgens JW (Ed.) Coffee: Growing, Processing, Sustainable Production. Second, Revised Edition. Wiley-VCH, Weinheim, 3–24.

Yildirim D (2020) "Bevanda asiatica": scholarly exchange between the Ottomans and Europeans on coffee. Osmanlı Araştırmaları/The Journal of Ottoman Studies 56: 25–47. https://osmanliarastirmalari.isam.org.tr/dergi/article/view/86/92